Abstract of the Disclosure

A method of fabricating a semiconductor device having a low dielectric constant is disclosed. According to the method, a silicon oxycarbide layer is formed, treated with plasma, and patterned. The silicon oxycarbide layer is formed by a coating method or a CVD method such as a PECVD method. Treating the silicon oxycarbide layer with plasma is performed by supplying at least one gas selected from a group of He, H_2, N_2O, NH_3, N_2, O_2 and Ar. It is desirable that plasma be applied at the silicon oxycarbide layer in a PECVD device by an in situ method after forming the silicon oxycarbide layer. In a case in which a capping layer is further stacked and patterned, it is desirable to treat with H_2-plasma. Even in a case in which an interlayer insulation is formed of the silicon oxycarbide layer and a coating layer of an organic polymer group for a dual damascene process, it is desirable to perform the plasma treatment before forming the coating layer.

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